

REMARKS / ARGUMENTS

Claims 1 and 2 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Claussen (USPN 3,418,446) and claim 1 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Kato et al. (USPN 6,649,872). Applicants are amending claims 1 and 2.

Specification

The examiner objected to the disclosure for introducing new matters. Claims 1 and 2 are amended accordingly.

Claim Rejections

The Examiner rejected claim 1 and 2 as being unpatentable over U.S. Patent No. 3,418,446 to Claussen (hereafter ‘446) on the grounds that ‘446 does not teach the equation (1) in the present invention, that the properties of the electrodes are same and the ratios of wire tensile strength are similar with each other. In addition, the Examiner contends that if a composition is physically the same, it must have the same properties since the chemical composition and its properties are inseparable.

However, ‘446 has features in controlling the compositions of outer layer(made of metal strip) and flux to be filled in the wire core in order to obtain the improved weld metal and controlling the filling ratio of the flux properly in order to prevent the outer layer's collapse during drawing process and unproportional flux' spread.

More specifically, ‘446 discloses flux cored wires comprising a outer layer constituting at least 72~75 % by weight of the electrode and a flux constituting optimum contents of 16 % by weight of the electrode, wherein the flux consisting of the following chemical compositions: 1) rutile 55.0%, manganese 16.0%, ferrosilicon 14%, magnetite 15.0% by weight of the core material(flux), 2) rutile 55.5%, manganese 22.5%, ferrosilicon 7%, magnetite 7.5%, silica sand 7.5% which added silica sand to increase the wire tensile strength, etc. It is stated that the tensile strength of the wire is improved from 78,000 that is the one of wire having conventional 16% of flux filling ratio to 81,000 that is the one of the wire having silica sand in addition to the conventional flux, i.e., more packed.

As described above, unlike the present invention, '446 discloses a wire filled with a flux of which chemical compositions were added by silica sand and more packed. As can be seen from the experimental results showing the different tensile strength depending on whether the silica sand of the core materials is added or not, the mechanical properties of the weld metal vary with the composition of flux filled.

Therefore, '446 is completely different from the present invention that can improve a rectilinear propagation by means of controlling the ratio of real tensile strength of flux filled wire to that of the wire in the state of metal pipe is unpacked, that is prior to flux packing during the manufacturing process.

With regard to the properties of wire electrode, the present invention and '446 are only similar with flux cored wire and the common manufacturing procedure (forming a steel strip – filling a flux – forming the strip into a O shape – drawing), but not same with the wire properties, i.e. mechanical and chemical properties.

The Examiner rejected claim 1 as being unpatentable over U.S. Patent No. 6,649,872 to Kato (hereafter '872) on the grounds that '872 does not teach the equation (1) in the present invention, that the properties of the electrodes are same and the ratios of tensile strength are similar with each other. In addition, the Examiner contends that if a composition is physically the same, it must have the same properties since the chemical composition and its properties are inseparable.

However, '872 also discloses the methods of controlling the compositions of wire and flux to be filled in order to promote the release of globules, decrease the sizes of globules and increase the number of transfers of globules. More specifically, [Table 4] and [Table 10] of '872 show that the mechanical properties (including tensile strength) of the wire and arc conditions vary with whether butt is present or not, whether plating is present or not, the difference of the flux filling percentage (there was not any wire flux unfilled), and the chemical composition.

It is stated that in accordance with the following conditions, the objects of the invention can be accomplished and concurrently the mechanical properties, for example, the tensile strength of the weld metal are 78,000 and 81,000, respectively.

With similar to the above '446, the present invention is completely different from '872 in which the mechanical properties of wire electrode vary with the variable chemical compositions.

With regard to the properties of wire electrode, the present invention and '872 are only similar with flux cored wire and the common manufacturing procedure (forming a steel sheath – filling a flux – forming the sheath into a O shape – drawing), but not same with the wire properties, i.e. mechanical and chemical properties.

Particularly, with regard to the wires (W1, W3) mentioned by the examiner having the ratio of tensile strength 582/524, it is stated in '872 that the wires are the flux cored wires having certain flux filling percentage. This is completely different from the present invention in which the ratio of the real tensile strengths in the state of flux-packed wire and the wire prior to flux packing is provided.

As described above, unlike the present invention, '872 discloses a wire filled with a flux and having specific compositions, and an improved welding workability according to the compositions.

With regard to the properties of wire electrode, the present invention and '872 are only similar with flux cored wire and the common manufacturing procedure (forming a steel strip – filling a flux – forming the strip into a O shape – drawing), but not same with the wire properties, i.e. mechanical and chemical properties.

Conclusion

As described above, since the present invention reading on the deviation in the real tensile strength according to whether the flux is packed or not could not have been easily conceived of by one of ordinary skill in the art to which the invention pertains based on '446 and '872, the present invention has inventiveness compared with '446 and '872. Therefore, we respectfully request that the Examiner issue a decision to grant a patent unless other rejections for refusal are found.

The Commissioner is hereby authorized to charge any additional required fees from Deposit Account No. 502811, Deposit Account Name THELEN REID BROWN RAYSMAN & STEINER LLP.

Should the Examiner have any questions concerning the foregoing, the Examiner is invited to telephone the undersigned attorney.

Respectfully submitted,

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